EPA Region 7 TMDL Review

TMDL ID	144	*Water Body ID*	0855/ 0859
Water Body Name	Muddy Creek and Brushy Creek (Fork)		
Pollutant	BOD, Ammonia and NFR		
Tributary			
State	MO *HUC*	10300103	
Basin	Lamine Basin		
Submittal Date	12/31/2001	*Completion Date*	1/2/2002
Approved	Yes		

Submittal Letter

State submittal letter indicates final TMDL(s) for specific pollutant(s)/ water(s) were adopted by the state, and submitted to EPA for approval under section 303(d) of the Clean Water Act.

Submitted as a final TMDL under a cover letter received December, 31, 2001, for Biological Oxygen Demand (BOD), ammonia and Non-Filterable Residue (NFR) in Brushy Creek and BOD in Muddy Creek. A total of four (4) TMDLs were submitted in one document.

Water Quality Standards Attainment

The water body's loading capacity for the applicable pollutant is identified and the rationale for the method used to establish the cause-and-effect relationship between the numeric target and the identified pollutant sources is described. TMDL and associated allocations are set at levels adequate to result in attainment of applicable water quality standards.

BOD is not a pollutant that can be allocated, and there is not a numeric water quality standard for BOD. The water quality standard (WQS) of concern is Dissolved Oxygen (DO) for which the criterion is 5 mg/L. Ammonia chronic criteria only apply to classified streams according to Missouri's WQS. Unclassified streams are subject to acute WQS and narrative WQS. Ammonia criteria is pH and temperature dependant. The criteria can be found in Missouri's WQS at 10 CSR 20-7.031 Table B. NFR does not have numeric WQS. Narrative criteria state "Waters shall be free from . . . Putrescent, unsightly or harmful bottom deposits. . ." or substances that cause "unsightly color or turbidity, offensive odor or prevent full maintenance of the beneficial use."

The allowable seasonable loads of BOD that will meet the in-stream DO, ammonia and NFR water quality criterion are identified and were calculated using the QUAL2E water quality model.

Numeric Target(s)

Submittal describes applicable water quality standards, including beneficial uses, applicable numeric and/or narrative criteria. If the TMDL is based on a target other than a numeric water quality criterion, then a numeric expression, site specific if possible, was developed from a narrative criterion and a description of the process used to derive the target is included in the submittal.

The beneficial uses of Davis Creek are described, as well as the WQS for those beneficial uses. The DO criterion is translated into a CBOD5 numeric target, and the CBOD5 is allocated at levels that will assure the DO criterion is attained. The ammonia numeric seasonal targets are taken directly from the temperature and pH dependent water quality criteria found in the Missouri WQS using site specific temperature and pH data. The target for NFR is 35 mg/L. This number is based on the Sedalia WWTP's permit limit for NFR. The facility recently upgraded. At the time of the last facility inspection no objectionable bottom deposits were noted below the facility. The facility is in compliance with their permit for NFR.

Link Between Numeric Target(s) and Pollutant(s) of concern

An explanation and analytical basis for expressing the TMDL through surrogate measures (e.g., parameters such as percent fines and turbidity for sediment impairments, or chlorophyll-a and phosphorus loadings for excess algae) is provided, if applicable. For each identified pollutant, the submittal describes analytical basis for conclusions, allocations and margin of safety that do not exceed the load capacity.

For the point source contributions of CBOD5 and ammonia, the QUAL2E water quality model establishes the link between CBOD and the DO water quality criterion, and establishes the link between ammonia loadings and the in-stream ammonia concentrations. The non-point sources are not believed to be contributing to the impairment. The WQS for NFR is a narrative free-from objectionable bottom deposits. Upon the latest site visit, no objectionable bottom deposits were observed. The facility is in compliance with their permit limit of 35 mg/L NFR.

Source Analysis

Important assumptions made in developing the TMDL, such as assumed distribution of land use in the watershed, population characteristics, wildlife resources, and other relevant information affecting the characterization of the pollutant of concern and its allocation to sources, are described. Point, non point and background sources of pollutants of concern are described, including magnitude and location of the sources. Submittal demonstrates all significant sources have been considered

The land use is mostly urban and industrial in the upper reaches of Brushy Creek watershed. The lower reaches of Brushy Creek and Muddy Creek are dominated by row crop, pasture and timber. Non-point sources are not believed to contributing to the impairment. There are 24 permitted facilities in the watershed. The Sedalia WWTP is the only source of impairment in the watershed. Whiteman Air Force Base and La Monte SE are not believed to be sources of impairment because of their proximity to the impaired reach.

Allocation

Submittal identifies appropriate wasteload allocations for point, and load allocations for nonpoint sources. If no point sources are present the wasteload allocation is zero. If no nonpoint sources are present, the load allocation is zero

Allocations were made using the QUAL2E model. The Load Capacity (LC) for CBOD5 is 148.6 ponds/day for summer and 1360 pounds per day for winter. Using QUAL2E it was determined the WQS of 5 mg/L DO would be met at these levels of BOD. The LC for ammonia is 26.2 pounds/day in the summer and 41.9 pounds/day for the winter. These numbers are based on the states WQS at site-specific pH and Temperature. The LC of NFR is 732 pounds/day. This is based on the target of 35 mg/L.

WLA Comment

The WLA for CBOD5 is 133.7 pounds/day in the summer and 1224 pounds/day in the winter. The WLA for Ammonia is 23.6 pound/day in the summer and 37.7 pounds/day in the winter. The WLA for NFR is 732 pounds/day.

LA Comment

The LA for BOD, Ammonia and NFR is zero.

Margin of Safety

Submittal describes explicit and/or implicit margin of safety for each pollutant. If the MOS is implicit, the conservative assumptions in the analysis for the MOS are described. If the MOS is explicit, the loadings set aside for the MOS are identified and a rationale for selecting the value for the MOS is provided.

The MOS is 10% of the LC for ammonia and CBOD5 and is implicit for NFR based on the conservative assumptions of an effluent dominated stream tightly regulated through permit limits and the significant plant upgrade that has occurred since the 1998 303d list.

Seasonal Variation and Critical Conditions

Submittal describes the method for accounting for seasonal variation and critical conditions in the TMDL(s).

Season variation is incorporated into the WLA and MOS by the use of seasonal criteria, and by using site-specific information.

Public Participation

Submital describes public notice and public comment opportunity, and explains how the public comments were considered in the final TMDL(s).

The TMDL was public noticed and interested parties were sent notices. The TMDL was modified to reflect public comments.

Monitoring Plan for TMDL(s) Under Phased Approach

The TMDL identifies the monitoring plan that describes the additional data to be collected to determine if the load reductions required by the TMDL lead to attainment of WQS, and a schedule for considering revisions to the TMDL(s) (where phased approach is used).

The Sedalia WWTP facility has additional monitoring requirements in their permit.

Reasonable assurance

Reasonable assurance only applies when reduction in nonpoint source loading is required to meet the prescribed waste load allocations.

The LA is zero, therefore there is no reasonable assurance required.